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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,751	11/26/2003	Akihiko Shiina	K06-163744M/TBS	3940
21254	7590	10/18/2006	EXAMINER	
MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			LUM VANNUCCI, LEE SIN YEE	
			ART UNIT	PAPER NUMBER
			3611	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/721,751

Applicant(s)

SHIINA ET AL.

Examiner

Lee Lum

Art Unit

3611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10,12-16,17,18, and 20-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) all is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A Request for Reconsideration was filed 7/27/06.
2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 1, 3-10, 12-15, 17, 18, 20-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukoshi.

Re **Claims 1, 3, 12, 20-22**, Mizukoshi discloses an electric power steering apparatus (fig 6) comprising

Driving gear/worm 5, and driven gear/worm wheel 2, the two offset with respect to each other (inherent),

Steering neutral position (obvious), and,

Wherein the driven gear includes a bias portion (figs 3-5), formed by biasing a part of an outer periphery of teeth, in a direction in which a first backlash is decreased, with respect to a second backlash (c3, In 27-28; "an appropriate backlash can be maintained").

The reference does not specify a first backlash in a first range of steering angles, this backlash being less than a second backlash in a second range of steering angles. However, this feature is application-specific, and would have been obvious to one skilled in the art as a specificity within an expected range of steering characteristics. Backlash is well-known to occur in the operation of gears, and can be adjusted via various means, including varying the shape of gear teeth.

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Re **Claims 4-7, 17, 18, 26-28**, Mizukoshi discloses the elements as provided above, but does not disclose “first/second ranges of steering ranges on each side of neutral”, and specificity about these terms/factors. However, these features are clearly application-dependent. The “ranges” would have been obvious as within those expected as a result of experimentation/development.

Re **Claims 8-10,13-15, 23-25, 29 and 31**, the reference discloses mathematical terms such as “gearing angle” (i.e., “gear ratio G”), “pressure angle”, and “pitch circle diameter”, but does not disclose the equation “ $\Delta RA = (\pi \times D) / (360 \times 60 \times 2 \times \tan(\alpha))$ ”. However, the calculations in (at least) c1, ln 67, to c2, ln 26, are functionally equivalent.

Nevertheless, it would have been obvious to one with ordinary skill to include these calculations to provide necessary detail to reproduce the invention, thus decrease costs of manufacture and assembly.

Additionally, specificity as to these terms (e.g., “the pitch circle diameter ranges from...” is also application-dependent, and would have been within an expected range as a result of experimentation.

B. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mizukoshi in view of Kojo et al 6041887.

Mizukoshi discloses the elements as provided above, but do not disclose a motor with variable power assist.

Kojo shows motor 24 as controlled to output variable power assist, according to the range of operation (i.e., of the steering wheel), as provided in c5, ln 24-34, ln 52-56, c6, ln 53-63, etc). It would have been obvious to one with ordinary skill in the art at the time the invention was made to include this feature, as shown in Kojo, to provide improved steering handling, thus increase driver comfort.

3. RESPONSE TO REMARKS

Applicant argues at length re Mizukoshi's, and Kojo's, purported failure to disclose the respective elements. However, Examiner reiterates her rejections as provided above, where the reference obviates the respective elements, including Mizukoshi's provision of "wherein a first backlash...is smaller than a second backlash..." (emphasis added).

Although it is well-known that backlash is common in the operation of gears, to state that "a first backlash is smaller than a second" without clearly describing both features reasonably lends a broad interpretation. Therefore, Applicant's remarks are groundless because he/she is implying more than that claimed; i.e., a specific description of the "second backlash" is necessary to distinguish it as Applicant implies. In this manner, the above-mentioned claim language is arguably obviated in Mizukoshi - "an appropriate backlash can be maintained" (emphasis added), c3, ln 27-28.

Subsequently, Applicant argues that "US patent law does not permit the Examiner to deny any...applicant a patent simply because the Examiner is of the opinion that a claimed invention is broad" (p3, second complete paragraph). This opinion is misguided because the Examiner, is simply *reciprocally* interpreting this language in a like manner; i.e., broadly (and nothing more). In this manner, the Examiner is clearly "referring to the claim language" (as admonished by Applicant; p3, last paragraph; it is unclear how the Examiner is to "examine/consider" claims without doing so).

On p6, Applicant argues that Mizukoshi "fails [to disclose] that the driven gear and worm wheel are offset from each other". Applicant is asked to refer to (at least) fig 3, that clearly depicts this relationship, where the teeth of the gears engage each other, the gears positioned at different angles, as very well-known.

On p7, Applicant argues that Kojo "fails to mention anything at all that is even remotely related to backlash...". Applicant is asked to refer to *In re Keller*, 208 USPQ 871, (CCPA 1981), as he is apparently rendering a separate analysis of this teaching reference, rather than as in combination with Mizukoshi as intended. Kojo (simply) teaches a very well-known motor with variable power; it is not required to disclose backlash, as Applicant implies.

Therefore, all rejections are proper, and maintained.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

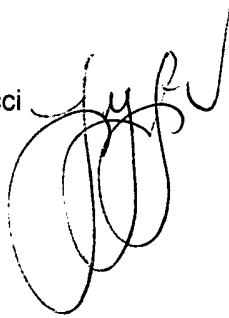
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

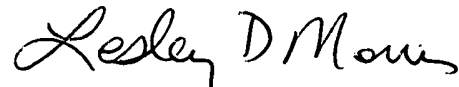
5. Communication with USPTO/Examiner

Any inquiry concerning this communication, or others, should be directed to Ms. Lum at 571 272-6649, M-F, 9-5. If attempts to reach the examiner are unsuccessful, her supervisor, Ms. Lesley Morris is at 571 272-6651. Our fax number is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for unpublished applications: private PAIR only, for published applications: private or public PAIR. For more information re PAIR: <http://pair-direct.uspto.gov>. Questions re access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866 217-9197 (toll-free).

Ms. Lee S. Lum-Vannucci
Examiner
10/12/06




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